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A Triangulation Method to Dismantling a Disciplinary "Big Deal"

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Abstract

In late 2012, it appeared that the University Library, University of Saskatchewan would likely no longer be able to afford to subscribe to the entire American Chemical Society "Big Deal" of 36 journals. Difficult choices would need to be made regarding which titles to retain as individual subscriptions. In an effort to arrive at the most conscientious and evidence-based decisions possible, three discrete sources of data were collected and compared: full-text downloads, citation analysis of faculty publications, and user feedback. This case study will describe the triangulation method developed -- including the unconventional approach of applying a citation analysis technique to usage data and survey responses. Such a thorough, labor-intensive, method is likely not practical for analyzing larger, multidisciplinary journal bundles. When it becomes necessary to break up a smaller collection important to researchers in a particular discipline, this technique may provide strong evidence to support librarian decisions as well as involve faculty in the process.

Introduction

Academic libraries acquire access to many of the electronic journals in their collections through "Big Deal" packages from major commercial publishers. Frazier (2001) was the first to use the term "Big Deal" to describe these multiyear licenses that enable libraries to access most, if not all, of a publisher's suite of journals online. In that same article Frazier strongly cautioned libraries against subscribing to them. He argued that the Big Deals ultimately only serve the interests of the large publishers by giving them greater market power to dictate pricing and contractual terms, while giving librarians less ability to build collections that actually serve the needs of their campuses.

In a follow-up article Frazier (2005) admitted that his advice was nearly universally ignored and Big Deals had become the dominant model of journal acquisition. In the late 1990s and early 2000s, such deals were initially viewed as a cost-effective way to increase access to a wider range of titles, streamline workflows, and facilitate the transition away from print serials. Indeed, they may still be beneficial to small- or medium-sized libraries who, through consortial

Big Deal subscriptions, acquire access to a much larger collection than they could have afforded on their own ([Cleary 2009](#); [Frazier 2005](#)).

As Frazier ([2005](#)) predicted, annual price increases of Big Deals have outstripped most academic library budgets. As serials prices continue to rise at unsustainable rates it is becoming increasingly necessary to consider breaking up these packages and just subscribing to the most important titles individually -- and some libraries are beginning to do this (see [Nabe & Fowler 2012](#)).

Most of the literature has focused on discussing and analyzing the Big Deals of commercial publishers and their large, multidisciplinary journal packages. This focus on the large multidisciplinary bundles is understandable considering their enormous size and price tag. There is considerably less discussion about breaking up smaller disciplinary journal bundles. This case study attempts to begin such a conversation by describing a unique method appropriate for this circumstance.

Background

The University of Saskatchewan (USask) is the largest post-secondary institution in the province of Saskatchewan, Canada. It is a public, medical/doctoral university with more than 21,000 students, and over 1,000 faculty. In recent years, the university has become progressively more focused on increasing research output and success in obtaining external funding. In 2011, the University of Saskatchewan joined the U15, a group of Canadian research intensive universities.

Like most university libraries in Canada, we acquire many of our major e-resource subscriptions through consortial licenses. The Canadian Research Knowledge Network (CRKN) is Canada's national consortium and it is through CRKN that we acquire access to the American Chemical Society's (ACS) Web Editions bundle of journals. This is a long-standing agreement, in place since 2001, so it was a shock to many librarians in Canada when the news came out in late 2012 that the renewal negotiations between CRKN and ACS had broken down. ACS had insisted on a new pricing model (for their international customers) based solely on usage, CRKN could not accept this unpredictable pricing scheme, and the license was terminated (for more details see the [CRKN Press Release](#)). The licence to the ACS bundle would expire at the end of 2013 and all Canadian university libraries would have to negotiate with ACS individually for continued access.

This was unwelcome news for many Canadian science librarians. At this time, the highly public SUNY Potsdam ACS cancellation experience ([Rogers 2012](#)) was a raging controversy in online discussion forums (see [Crawford 2012](#) for a complete synopsis); and the prospect of conducting our own negotiations directly with ACS was not eagerly anticipated. As Crawford ([2012](#)) notes, ACS produces top-rate journals, the quality of their products is not in dispute, but they also have a long history of high prices and aggressive price increases. Canadian librarians were reaching a breaking point and facing some difficult decisions.

It became clear during conversations with collections librarians at USask that, if we were to negotiate on our own without our national consortium, we would likely not be able to afford the entire ACS bundle of journals. There was a high possibility that we would cancel the ACS package. As the liaison librarian for the Chemistry Department, it fell to me to advise the library as to which individual ACS titles we should maintain from the bundle. And so this analysis was initiated.

Strong reaction from Canadian librarians and the Canadian Society for Chemistry (CSC) prompted CRKN and ACS to return to negotiations. They eventually came to an agreement

during the summer of 2013 to extend the previous licence until the end of 2015. Since his analysis was already underway before the new agreement was reached, I decided to follow through and complete the analysis since the future (beyond 2015) remains uncertain and the results will likely be relevant at some impending date.

Objective

Unlike most other cancellation analyses, I did not have a budget target for spending; I simply needed to be prepared with a ranked list of the most important ACS titles to retain if we needed to cancel the bundle. When the time came to cancel, I could use the ranked list to re-subscribe to individual titles up to the monetary amount available to me at the time.

Knowing the value of the ACS journals to the chemistry faculty, I wanted to be able to present them with several lines of convincing evidence to back up any cancellation and re-subscription decisions -- and I wanted to be able to give them a voice in the process.

The objective of this project was to develop a ranked list, in the most conscientious and evidence-based manner possible, of the most important ACS journal titles to subscribe to individually should we need to break-up the Web Editions bundle.

Triangulation Method & Results

Justification

There are a number of data sources and strategies available to analyze a journal collection. Basic usage statistics (full-text downloads) are the most obvious and easily obtained data. Blecic et al. (2013) describe a method of combining usage statistics with a cost-per-use figure (based on the current list-price for the title, if available) to rank the journal titles within a Big Deal. Nabe and Fowler (2012) outline several ways in which these download statistics can be inflated, and caution that they are not an accurate indicator of demand. Other, more indirect, indicators of journal usage, such as citation analyses, have been widely applied in collections evaluation projects (see Hoffmann & Doucette 2012). Some have warned that citation analysis alone can be a narrow measure -- limited to titles indexed in particular databases. Qualitative measures such as surveys and interviews of users can enhance, enrich, and expand upon the results of a citation analysis (deVries et al. 2010). One data source alone does not seem to be enough. So, for this analysis I collected usage statistics, performed a citation analysis, and gathered user feedback in an effort to triangulate all available data and arrive at the most evidence-based decisions possible.

Adopting and Adapting Bradford's Law

Journal usage within a particular discipline typically centers on a cluster of heavily used titles, followed by a much larger group of titles that get moderate to low use. Perhaps the most well-known collection usage pattern is the "80/20 Rule," or Pareto Principle, in which 80% of usage is concentrated in 20% of the collection. This rule primarily deals with usage (circulation or download) statistics and can be applied to many resource types in library collections, not just serials. Whereas, "Bradford's Law of Scatter" is primarily applied to serials and is usually formulated through citation analyses (Nisonger 2008).

Bradford's Law gauges journal productivity in a specific discipline by identifying a core group of titles that are heavily cited, followed by two or more zones of titles with decreasing citations. In other words, there is a concentration of highly productive titles, followed by a pattern of

increasing scatter or lower productivity. Typically, when Bradford's Law is applied in collections analyses, journals from a list of citations (such as an assemblage of bibliographies) are ranked according to number of times cited, then divided into several zones -- each with an equal number of citations ([Andrés 2009](#)). Bradford predicted that the number of journals in each of these zones would follow the ratio: 1:n:n², but his data only approximately fit this formula. Analyses may still confirm the general law of concentration followed by scatter even if the data does not precisely conform to the predicted ratio (Nisonger 1998).

This analysis was never intended to be a complete and comprehensive bibliometric study. I decided to adapt the idea of Bradford's zones of decreasing productivity, but it was unnecessary to the purpose of this study to determine if the three zones in my citation analysis confirmed the predicted ratio of 1:n:n². Also, I extended the concept of Bradford's zones to the analysis of usage statistics (downloads) and user feedback (survey) data. This was, admittedly, an unorthodox application of this method. But I found that adapting and applying the same technique consistently across the three disparate sources of data gathered in this study useful in combining the results to arrive at an overall ranked list.

Method 1: Full-Text Downloads (Usage Statistics)

Usage statistics, in the form of number of successful full-text downloads (PDF and HTML), are easily obtained by institutional subscribers on the ACS Publications web site page InfoCentral. I obtained the total number of downloads for every subscribed ACS journal on the ACS Publications platform for the years 2011, 2012, and 2013. Not all of these titles were part of the Web Editions bundle; some we subscribed to individually. For the purposes of this analysis it made sense to look at all ACS titles that we had access to, not just those in the current bundle, because if we cancel the bundle we would select titles to subscribe to individually from among the full list of available publications.

For each title I calculated the mean number of downloads for the three years of data and sorted the figure by titles with the highest number of downloads (Figure 1). The zones for the download data were calculated by totalling all of the average downloads for each title and dividing by three ($54,952/3 = 18,317$). Each of the three zones have approximately the same number of downloads (~18,317).

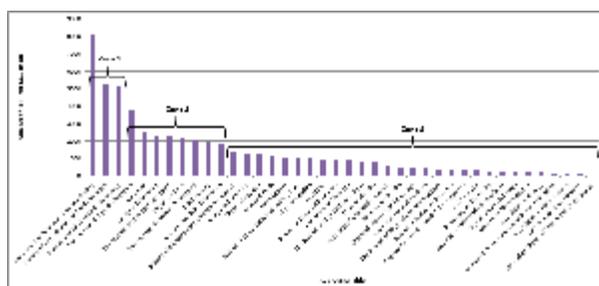


Figure 1: Mean downloads for each ACS title for the years 2011-2013, sorted by highest number of average downloads per title.

For consistency across the methods/data sets I have named each of the three zones to reflect terms I used in the user survey: Zone 1 = "Essential", Zone 2 = "Good to Have", and Zone 3 = "Unnecessary." Tables 1 and 2 list the titles that fall into Zone 1 and 2 respectively.

Table 1: "Essential" titles (Zone 1) based on usage data.

ACS Journal Title
Journal of the American Chemical Society

Table 2: "Good to Have" titles (Zone 2) based on usage data. *When subscribing to titles individually, the *Journal of Physical Chemistry A, B, & C* come as a package. Both B and C fell into Zone 2 in this usage analysis, so I have added A to the list as well.

ACS Journal Title
The Journal of Organic Chemistry
Langmuir
Analytical Chemistry
The Journal of Physical Chemistry A, B, & C*
Organic Letters
Biochemistry
Journal of Medicinal Chemistry

Method 2: Citation Analysis

Citation analysis is another, more indirect, indication of journal usage. Chemistry researchers have always been assumed to be the primary users of this journal bundle, so I focused on this group in the citation analysis and user survey.

Citation Analysis Part 1: Publication Venues of Researchers

I performed an affiliation search in Scopus for the years 2011-2013. The query was: (AFFIL("University of Saskatchewan" AND "Department of Chemistry") AND PUBYEAR > 2010 AND PUBYEAR < 2014). I found 185 articles with authors that stated their affiliation to be the Department of Chemistry, University of Saskatchewan for these years.

The 185 articles retrieved were published in 93 unique journals, from all publishers (not just ACS). Of these 93 journals, 15 were ACS publications. Of course, researchers can publish in whichever journals they choose, whether or not the library subscribes to the title. However, where a researcher chooses to publish is a strong indicator of the importance of that journal to them. This step is also needed in order to acquire the reference lists from these articles for Part 2 of the citation analysis. For these reasons I decided to include this data to the analysis as well.

The zones for Part 1 of the citation analysis data were calculated by adding up the total number of articles and dividing by three ($185/3 = 61.6$). Each of the three zones consist of roughly 62 articles: Zone 1 = 63; Zone 2 = 69; Zone 3 = 53. Groups of journals that all have the same number of articles cannot be broken up into different zones without a value judgement being placed on them. So, the zones could only be established to the nearest journal "group" (Figure 2). Tables 3 and 4 list the titles that fall into Zone 1 and 2 respectively.

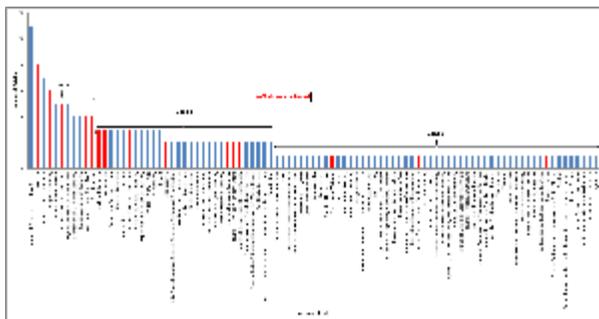


Figure 2: The publication venues of researchers affiliated with the Department of Chemistry, University of Saskatchewan, 2011-2013. ACS publications are in red.

Table 3: "Essential" titles (Zone 1) based on citation analysis (Part 1) data. *See note on Table 2.

ACS Journal Title
Langmuir
Inorganic Chemistry
The Journal of Physical Chemistry A, B, & C*
Organic Letters

Table 4: "Good to Have" titles (Zone 2) based on citation analysis (Part 1) data.

ACS Journal Title
Analytical Chemistry
Biochemistry
ACS Catalysis
Journal of Organic Chemistry
Journal of Physical Chemistry Letters
Journal of the American Chemical Society

Citation Analysis Part 2: Journals Cited by Researchers

In Scopus, I retrieved the reference lists from each of the 185 articles identified in Part 1 of the citation analysis and combined them in one large list of 6,732 items, from all publishers (not just ACS). This list was exported to an Excel spreadsheet then sorted by source titles and ranked by most cited titles. The vast majority of the sources cited were journals. The zones for Part 2 of the citation analysis data were calculated by adding up the total number of citations and dividing by three ($6,732/3 = 2,244$). Zone 1 consists of 2231 citations of 24 journals -- ranging from 310 cites to 48 cites per title (Table 5). The seven ACS titles that fell into Zone 1 are listed in Table 6. For this study it became too complicated and time-consuming to attempt to combine journals with title changes or splits/mergers -- hence *The Journal of Physical Chemistry* as well as its three daughter titles (*The Journal of Physical Chemistry A, B, & C*) all rank in the top 24. I consider all four titles together as one title (Table 6) since this is how an individual subscription is offered. As stated above, the purpose of this study was not to perform a complete and comprehensive citation analysis, but instead, to get a sense of the top ACS titles in each phase of the analysis. I do not believe that any additional time working out the various small inconsistencies in the citation analysis data would have significantly altered the results in Zones 1 and 2.

Zone 2 consists of 2,238 cites of 132 journals -- ranging from 46 cites to eight cites per title. The 14 ACS titles that fell into Zone 2 are listed in Table 7. Zone 3 contains all titles cited seven times or less, as well as miscellaneous non-journal sources that were typically cited only once each.

Table 5: All titles in the "Essential" (Zone 1) citation analysis (Part 2) data, ranked by the number of times cited. ACS titles in red font.

Journal Title	Times Cited
Journal of the American Chemical Society	310
Langmuir	157
Journal of Organic Chemistry	139
Journal of Chemical Physics	134
Angewandte Chemie - International Edition	133
Journal of Physical Chemistry B	126
Physical Review B - Condensed Matter and Materials Physics	100
Tetrahedron Letters	97
Tetrahedron	81
Chemical Communications	78
Physical Review Letters	77
Organometallics	76
Proceedings of the National Academy of Sciences of the United States of America	74
Science	73
Journal of Electroanalytical Chemistry	71
Journal of Physical Chemistry C	69
Journal of Biological Chemistry	64
Chemical Reviews	61
Journal of Physical Chemistry A	60
Nature	54
Journal of Physical Chemistry	52
Organic Letters	49
Journal of Colloid And Interface Science	48
Journal of Organometallic Chemistry	48
Total Cites	2231

Table 6: "Essential" titles (Zone 1) based on citation analysis (Part 2) data.

ACS Journal Title
Journal of the American Chemical Society
Langmuir
The Journal of Organic Chemistry
The Journal of Physical Chemistry A, B, & C
Organometallics

Chemical Reviews

Organic Letters

Table 7: "Good to Have" titles (Zone 2) based on citation analysis (Part 2) data.

ACS Journal Title
Analytical Chemistry
Inorganic Chemistry
Biochemistry
Accounts of Chemical Research
Chemistry of Materials
Environmental Science & Technology
Nano Letters
ACS Nano
Journal of Medicinal Chemistry
Macromolecules
Energy & Fuels
Crystal Growth & Design
Journal of Agricultural and Food Chemistry
Journal of Physical Chemistry Letters

Method 3: User Survey

The ACS journals are very important to the chemistry researchers, instructors, and students; and this is the group that we have often assumed to be the primary users of this package. As the CRKN/ACS situation developed I kept the Chemistry Department informed and they expressed interest and concern in the outcome. For these reasons, I included an online user survey in this analysis to make sure that their valuable input was collected and that they felt their voices were heard.

At the time of this study, in late 2013, the Department of Chemistry consisted of 18 faculty, and 80 graduate students (53 PhD, 27 MSc). Additionally, there were 18 staff (lab instructors, sessional instructors, technicians, etc.), and 14 other researchers affiliated with the department (this group includes associates, post-doctoral researchers, emeriti, etc.). To get the widest possible input I included all of these groups in the survey and the departmental assistant forwarded the e-mail invitations to these mailing lists on my behalf. The survey remained open for three weeks and one reminder was sent. Chemistry undergraduate students were not included in this user survey. The Behavioural Research Ethics Board of the University of Saskatchewan determined that this study did not require ethics approval.

There were a total of 43 responses -- an overall response rate of 36.9%. The response rate for faculty was especially good at 66.7% perhaps further indicating the value they place on this package of journals. The survey listed each ACS title currently subscribed to either individually or through the Web Editions bundle. For each title, respondents were asked to indicate whether institutional subscription access is "Essential," "Good to have," or "Unnecessary" with regards to *their own* research, teaching, and other professional activities (Figure 3). This is the same title list as in the usage analysis (Method 1) -- with the addition of *Chemical & Engineering News*. This title was added to our subscription in late 2013, so was included on the survey but

there was no usage data for it. The zones for the survey data were calculated by adding up the total number of "Essential" responses for all titles and dividing by three ($669/3 = 223$). Each of the three zones has approximately 223 "Essential" responses. Tables 8 and 9 list the titles that fall into Zone 1 and 2 respectively. I decided to focus only on the "Essential" responses at this point for the sake of simplicity.

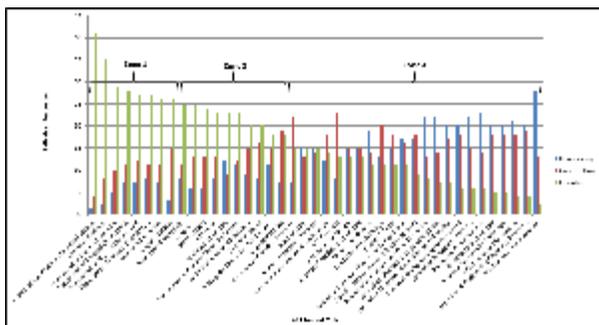


Figure 3: Department of Chemistry researchers' responses to user survey, sorted by "Essential" responses.

Table 8: "Essential" titles (Zone 1) based on survey data.

ACS Journal Title
Journal of the American Chemical Society
Chemical Reviews
The Journal of Organic Chemistry
The Journal of Physical Chemistry A, B, & C
Inorganic Chemistry
Organic Letters

Table 9: "Good to Have" titles (Zone 2) based on survey data.

ACS Journal Title
Chemistry of Materials
Langmuir
Nano Letters
ACS Nano
Analytical Chemistry
Journal of Physical Chemistry Letters
Journal of Chemical Education
Macromolecules
ACS Applied Materials & Interfaces
Organometallics

Bringing It All Together: The Triangulation Comparison

In the final step of this analysis I combined the data from each of the three methods. The overall "Essential" list contains any ACS title that that appeared *at least once* on any of the Zone 1 lists in this analysis. These are the most important titles to retain a subscription to (Table 10). The overall "Good to Have" list contains any title that appeared on *more than one* "Good to Have"

list (Table 11). These are the titles that we would also like to subscribe to depending on budgetary allowance when the time comes.

Table 10: The overall "Essential" list. In no particular order.

ACS Journal Title
Journal of the American Chemical Society
Chemical Reviews
The Journal of Organic Chemistry
The Journal of Physical Chemistry A, B, & C
Inorganic Chemistry
Organic Letters
Journal of Agricultural and Food Chemistry
Environmental Science & Technology
Langmuir
Organometallics

Table 11: The overall "Good to Have" list. In no particular order.

ACS Journal Title
Analytical Chemistry
Journal of Physical Chemistry Letters
Biochemistry
Journal of Medicinal Chemistry
Chemistry of Materials
Nano Letters
ACS Nano
Macromolecules

In addition to these two lists I also allowed myself two "wildcard" titles: *The Journal of Chemical Education* and *Accounts of Chemical Research*. Since this analysis focused primarily on the publishing habits and opinions of researchers, it does not reflect the needs of laboratory instructors and undergraduate students. As the liaison librarian to chemistry, I am anecdotally aware of the importance of *The Journal of Chemical Education* to chemistry laboratory instructors, though this title did not show up prominently in this analysis. This group of staff were invited to participate in the survey but few responded. Similarly, I consider *Accounts of Chemical Research* to be a title important to undergraduate chemistry education. I could not devise a practical means of including undergraduate data in this analysis. I hoped that undergraduate, and other campus users' needs would be reflected in the usage data (Method 1).

With the final Essential list (Table 10) in hand I did a quick check of the list prices for subscriptions to just these 10 titles on the ACS web site. I was only able to determine the current (as of 2014) institutional print prices, the electronic subscription prices were not available. We would not consider a print-only subscription, but this did give a rough estimate of what we might pay if we were only to subscribe to these 10 Essential titles: it would be approximately just over half the most recent cost of the entire Web Editions bundle of 36 journals.

Discussion

An Unanticipated Outcome

An interesting outcome of this triangulation analysis is that we now have evidence that there are other users of the ACS journals on campus besides the Department of Chemistry researchers. I had long suspected this, but had no way of proving it. Usage data is usually completely anonymous. The only identifying feature of the user is an IP range -- which cannot assist us in determining the research area of the user. This analysis was conducted under the commonly-held assumption that the chemists are the primary users of the ACS journals; the citation analysis and the user survey focused only on this group. Full-text download data indicated that three titles are heavily accessed and fall in Zone 1 of this study. Two of these titles, the *Journal of Agricultural and Food Chemistry* and *Environmental Science & Technology* do not appear in any other Zone 1 lists in this analysis. The other Zone 1 lists are based on Department of Chemistry researchers' publications and survey responses. This is indirect evidence that there are indeed other heavy users of the ACS journals on campus; heavy users of these two titles at least. The University of Saskatchewan has a large and active College of Agriculture and Bioresources, as well as a School of Environment and Sustainability. It is likely that these units are driving this usage, but this cannot be confirmed with the information at hand.

This outcome raises the question of whether the analysis should also take into account the opinions and publishing habits of researchers in other disciplines. This would mean surveying a much larger group and performing a broader citation analysis. I could logically include researchers in the College and School just mentioned to see if they have the same investment in this journal package as the Department of Chemistry. I still believe that the chemistry researchers are the primary users of the bundle *as a whole*, and have a strong attachment to this collection in general -- despite the fact that they do not fully use the entire collection. Extending this analysis beyond this primary user group would not be practical or meaningful in the same way. This analysis does give us awareness going forward that when making decisions on the ACS titles we will need to consider the broader implications across campus.

On the Triangulation Method

This type of analysis is not appropriate or feasible for analysing much larger, multi-disciplinary journal bundles. For one reason, Bradford's Law, when applied to citation data, is really only applicable for finding core journals within a discipline or sub-discipline. Citation patterns vary widely across disciplines, so this kind of analysis would create unfair advantages for the journals in disciplines with high publication and citation rates. Secondly, it is impractical to consider surveying researchers across all departments on campus on every title in a much larger collection of hundreds of titles (such as the Elsevier or Wiley collections). As mentioned earlier, the literature already discusses other more appropriate approaches to analysing these larger collections (e.g. [Blecic et al. 2013](#)).

This analysis achieved my objective; it enabled me to develop a ranked title list with a high degree of confidence since it was derived by the triangulation of several different lines of evidence. Although the analysis was a significant amount of work, this was primarily because I was working out a new method and was attempting to carefully document results in order to share them with chemistry faculty and librarian colleagues. Without these constraints in place, I anticipate that I could now complete a useful, "quick and dirty," analysis reasonably swiftly. The obviously well-used titles, from usage and citation analysis data, were very apparent almost immediately during this process. The most cumbersome and time-consuming part of a citation analysis is tidying up the data (i.e. combining abbreviated and non-abbreviated titles, correcting titles that land in the wrong spreadsheet column, dealing with changed titles and

other variations). A large part of the data exported from Scopus into the Excel spreadsheet was usable as-is and could give the expedient results required when time is short and careful documentation unnecessary. The element of this triangulation method that I would not attempt in a quick analysis is the user survey. Generally, our clients entrust us to manage the collections on their behalf and do not want to be over-consulted. In some circumstances, such as when faculty have a strong connection with a particular resource, it may be wise to include them in the process.

Involving the Users

I included the user survey in this analysis for some specific reasons. Since the chemistry researchers have always been assumed to be the primary users of the ACS journals their opinion on the most important titles in the collection was valuable information to include. As the chemistry liaison librarian I am highly aware of the strong connection they have with this bundle too. With this in mind, I made a concerted effort to keep them informed of the situation with the CRKN and ACS renewal negotiations as it developed -- because it seemed highly likely that it might affect our access to the journals. I wanted the researchers to have plenty of notice about what could happen and not be caught by surprise should we have to cancel.

Another aspect of this is somewhat political. The survey was intended to give faculty and grad students a voice in the process -- but also to engage them in this issue. I see it as my professional responsibility, whenever possible, to help raise the awareness of researchers to the challenges that libraries face in the current scholarly publishing market. Unsustainable serials price increases come not just from large commercial publishers, but (more rarely) also from their own scholarly societies. Chemistry has the dubious distinction of being the discipline with the highest priced journals year after year ([Bosch & Henderson 2014](#)), so it is perhaps especially important to communicate about these issues with this group of researchers.

Conclusion

I developed this triangulation method out of necessity. I was faced with the unhappy possibility of having to dismantle a relatively small bundle of journals highly important to one discipline of researchers. In order to be accountable to these researchers, I needed to make the most conscientious and evidence-based decisions possible. Three discrete sources of data (full-text downloads, citation analysis of faculty publications, and user feedback), were collected and analyzed. Applying Bradford's Law to the data in each of these three areas enabled me to combine all of the data and develop an overall ranked list with a high level of confidence. It may be considered unconventional to apply a citation analysis technique to analyse usage and survey data, but the objective of this study was not to carry out a traditional bibliometric research project. This study also enabled me to indirectly confirm that there are other users of this package on campus -- though the Department of Chemistry is still likely the dominant user group for the ACS journal bundle as a whole.

LIS literature often discusses economic issues and analysis techniques concerning the large multi-disciplinary "Big Deals" from commercial publishers such as Elsevier and Wiley, but little has been written about the procedures or politics involved with breaking up much smaller journal bundles, important to a specific group of users. It is my hope that this article begins such a discussion. I hope others will apply, adapt, and improve this technique in their own collections decisions involving small, single-disciplinary journal packages. Additionally, I encourage all librarians to actively engage researchers at their institutions in conversations about the challenges of the current serials market.

Acknowledgements

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